

Professor Michael Alder – Written Evidence (LUE0008)

1. INTRODUCTION

My name is Professor Michael Alder. I am Professor (Emeritus) from the University of Essex in the Rural Environment. I am a Fellow of the Royal Agricultural Society. My academic specialism has for many years focused on Land Use in the UK. My involvement in land use issues goes back many years. In 1978 I was awarded a Churchill Fellowship to study this subject in Japan.

Whilst I am submitting evidence on a personal basis, I am also Chair of the Solar Campaign Alliance. The Alliance acknowledges the importance of renewable energy sources and accepts that solar energy has a part to play in supplying renewable energy. However, the Alliance is against unregulated inappropriate solar developments on green field land across the UK. One central element in the current land use debate is the use of land for food production versus land use for energy production. The Alliance believes that valuable farm land for food production must be protected.

2. QUESTION 1 – LAND USE CHALLENGES

Land area is finite and a balance must be found between all the pressures on this resource. These pressures are greater than ever before. The environmental concerns are pushing land use towards re-wilding schemes and encouraging a wide range of approaches to land use to encourage biodiversity. This is being financially incentivised through the government's Environmental Land Management Scheme (ELMS).

There are other land use changes, notably the need to increase the percentage of land in England devoted to woodland and forestry.

Land is under pressure as the need for housing increases together with associated infrastructure projects.

The most worrying statistics relate to agricultural land loss. Average land loss to UK agriculture has been assessed at 40,000 hectares (96,000 acres) a year and rising. In reality, the figure could be a lot higher, with woodland targets set at 30,000 hectares a year, and infrastructure projects and housing expanding and increasing land usage. A study by the UK Centre of Ecology and Hydrology suggested a loss of two million acres between 1990 and 2025, and a study by the University of Cambridge 2014 suggested a land shortfall to farming of two million hectares (4.8 million acres) by 2030. Every projection shows that loss of productive land and new environmental

schemes, while fundamentally a good thing, will reduce food productivity; the same applies to woodland areas. Land being used for energy purposes, e.g., the production of biofuels or for solar farms, will further reduce the food-growing areas.

In 2021 bioenergy crops and solar farms accounted for a 3.3% loss of arable land. Future predictions are for a further 6.5% loss. This means that 445,000 acres are now not available for food production and could be compounded by a further loss of 900,000 acres.

The facts above illustrate the land challenges for England and the UK.

The central problem is that there is no national land use plan or strategy. The guidance on land use that is provided through the NPPF (National Planning Policy Framework) is open to considerable interpretation at local level. Regulatory powers are weak. Decisions made at local level vary considerably leading to an incoherent approach to important national land use decisions.

3. FARMING AND LAND MANAGEMENT – QUESTIONS 4 & 5

4. What impacts are changes to farming and agricultural practices, including food production, likely to have on land use in England? What is the role of new technology and changing standards of land management?
5. What impact are the forthcoming environmental land management schemes likely to have on agriculture, biodiversity and wellbeing? What do you see as their merits and disadvantages?

Land does fall into categories; for example much of the land that is best suited to nature restoration and carbon removal produces little food. In determining a land use policy it is also very relevant to note that in England the largest farms make up only 8% of farms but occupy 30% of farmland and produce 57% of farming output.

The analysis in the National Food Strategy suggests that the overwhelming majority of land in England will still be farmed 63-65% of total land area compared to 70% today. The strategy proposes a three-compartment model of farming, to get there a 2-4% of existing farmland might be given over to native woodland.

In essence, the strategy proposes Defra devise a Rural Land Use Framework to be in place by 2022. This would include a National Rural Land Use Map (this mirrors the author's recommendation in his 1978 Churchill Fellows report). One element that would direct the

outcome of the map would be the productivity of agricultural land derived from the June Farm Survey and the Agricultural Land Classification. This proposal is discussed in a subsequent paragraph.

A key statement in the National Food Strategy is “We need better data on how the land should be used. Unless we have a clear idea of which land should ideally be used for what we could compromise our food security or make our environment even worse.” This statement is analysed in the section below on land classification and under questions 6-9 on biodiversity.

Food production systems are changing to become more sustainable and techniques such as regenerative farming incorporating such things as precision farming will become more dominant, but protecting productive land will be central to maintaining food security.

3.1 Land Classification Systems

Land is currently classified using the Agricultural Land Classification system (ALC). This system goes back to the 1980s. It breaks land into 6 categories (1, 2, 3a, 3b, 4 and 5) which are broadly defined by their productive potential. The original ALC maps are on a scale of 1:250,000 and are regarded as suitable for strategic purposes. When a developer wishes to propose a change of land use and has to show the ALC, the advice is to get a more detailed survey. The metrics used in this resurvey are old and not fit for purpose. In particular the split between 3a and 3b land is very marginal and very productive farmland is often designated 3b land.

This designation is very significant in planning terms as the NPPF provides protection, at least to some extent, to land graded 1, 2 & 3a. This is called BMV land (Best & Most Versatile). Combining all land grades with yield data as proposed in the National Food Strategy and then using this in revised NPPF guidelines would provide some greater protection for grade 3b, and sometimes grade 4 land.

Alternatively, other systems of land/soil classification could be used. One of these is Soilscales. Soilscales is a 1:250,000 scale, simplified soils dataset covering England and Wales. It was created from the more detailed National Soil Map with the purpose of effectively communicating a general understanding of the variations which occur between soil types, and how soils affect the environment. Soil heavily influences our whole

ecosystem and is a fragile resource that needs to be understood and protected.

Soilscapes was developed by Cranfield University and sponsored by Defra. There are 27 descriptions that cover issues such as drainage, fertility, carbon and cropping.

4. **NATURE, LAND USE AND BIODIVERSITY – QUESTIONS 6-9**

6. What do you see as the key threats to nature and biodiversity in England in the short term and longer term, and what role should land use policy have in tackling these?
7. What are the merits and challenges of emerging policies such as nature-based solutions (including eco-system and carbon markets) local nature recovery strategies and the biodiversity net gain requirement? Are these policies compatible, and how can we ensure they support one another, and that they deliver effective benefits for nature?

Environment, climate change, energy and infrastructure

8. How will commitments such as the 25-year environment plan and the net zero target require changes to land use in England, and what other impacts might these changes have?
9. How should land use pressures around energy and infrastructure be managed?

4.1 **Biodiversity is of great importance and has been declining in England**

To this end, the 2021 Environment Bill mandates most new development will deliver an overall gain in biodiversity. This is called 'biodiversity net gain '(BNG) or sometimes 'net biodiversity gain' (NPG). This is therefore an important aspect for all local planning authorities to consider in approving or rejecting planning proposals and, in particular, solar farms. The law does not apply to NSIPs (Nationally Significant Infrastructure Projects). Nevertheless, developers may wish to show their NSIP proposals do deliver BNG.

4.2. Measurement

Biodiversity was originally measured by using Biodiversity Metric 2.0 (JPO 29) Natural England 007.2019; this has now been superseded by Biometric 3 (JPO 39) Natural England 07.2021.

4.3. Commentary

Ecologists in the UK generally regard the metric as not fit for purpose. Prof. K. Willis (Ref 3) a leading ecologist from Oxford University said in 2021 that the BNG total *"will promote further loss and fragmentation of some of the UK's natural environment and even more important the ecosystem services that flow..."* She concludes that *"net biodiversity gain will end up being net biodiversity loss"*.

Dr C Betts, who head up Betts Ecology explains in more detail: (Ref 1):

"1, The metric calculation only accounts for direct impacts on habitats within the footprint of a development or project. It is only a simple assessment tool and only considers direct impacts on biodiversity through impacts on habitats. Indirect impacts, which it is important to consider, are not included in the metric.

2. Biodiversity unit calculations are not absolute values but provide a proxy for the relative biodiversity worth of a site pre- and post-intervention. The metric is not a substitute for expert ecological advice. The metric should never be used to override or undermine the mitigation hierarchy or any existing planning policy or legislation.

3. The metric does not include species explicitly but uses habitat types as a proxy for the so-called "biodiversity value" of the species communities of those different habitats. (Metric outputs do not change existing levels of species protection and do not replace the processes linked to species protection regimes).

4. Using habitats as a proxy for biodiversity is a simplification and biodiversity metric unit calculations/scores are not scientifically precise or absolute values, only a proxy for the relative biodiversity worth of a habitat or site.

5. The metric and any numerical outputs are not absolute values but must be interpreted using ecological expertise and common sense. If they are used at all, it should only be as one

(potentially misleading, so great care needed) element of the evidence that informs plans and decisions. The metric is not in or of itself a solution to biodiversity decisions. The metric does not give instructions, for example on the species to use in habitat enhancement/compensation.

6. Biodiversity metrics have a focus on typical habitats and widespread species; protected and locally important species' needs are not considered; protected sites and irreplaceable habitats are not adequately measured by the metric. Notable habitats and features require appraisal separately by a skilled ecological scientists/naturalist."

The comments by Willis & Betts are backed by a refereed research paper (Sophus zu Ermogasson et al, June 2021). The paper notes that losses in habitat areas (as a result of development) will be traded for habitats of higher distinctiveness in the future. The paper states "*Mandatory BNG will generally trade biodiversity losses today for uncertain future gains*".

The conclusion is "*It is widely recognised that promises of future biodiversity gains is risky*". The research was backed up by an analysis of 55 BNG assessments. In these there was a promise of a 25% increase in biodiversity but in fact there was a 34% reduction in green spaces.

Sophus zu Ermogasson concludes "*that the safest mechanism for reducing the biodiversity impact of infrastructure is to avoid impacts to biodiversity initially. In practice this means redirecting development to previously degraded sites wherever possible*".

In providing evidence for the Land Use inquiry, the author agrees with the conclusions on the use of the BNG metric for land use planning and the research conclusions of zu Ermogasson.

4.4. Land use and solar farms and renewables

Solar farms are becoming an increasing land user, often on productive land. Question 9 asks how should land use pressures around energy and infrastructure be managed? The answer is by allowing for the growth of solar on less productive land; land of low environmental value, brownfield sites, and commercial and domestic roof space. It must be understood that solar power is relatively inefficient and not carbon neutral. On-shore wind allows for agricultural land use on 80% of the area but there are

landscape implications from such land usage. Bioenergy crops are also occupying an increasing land area, and controlling the growth of this land use is difficult and will be primarily achieved by a price mechanism.

The most important element is ensuring that appropriate metrics and subsequent regulations and guidelines are in place to central land use in energy production.

5. **CONCLUSION – QUESTION 12**

12. Which organisations would be best placed to plan and decide on the allocation of land for the various competing agendas for land use in England, and how should they set about doing so?

Developing Land Use plans is the obvious responsibility of Defra. Government has a clear responsibility in putting in place a strong regulatory framework. The Planning Inspectorate should oversee the implementation of land use changes. Nationally Significant Infrastructure Projects (NSIPs) should continue, but the project thresholds should be lower (e.g., Solar Farms 50MW to 30MW). Local Planning Authorities should be provided with more definitive guidelines through the NPPF.

Overall recommendations are:

5.1 A national land use plan should be adopted which would include a national rural land use map.

5.2 Consideration needs to be given to appropriate land use categories. This could be the three-compartment model as proposed in the National Food Strategy or a broader model with such categories as agriculture, forestry, woodland, urban areas, re-wilding and environmental areas, water supply and national parks.

5.3 A central element of any future national land use model must be the maintenance of productive agricultural land to guarantee the nation's food security.

5.4 To achieve the above objectives, appropriate metrics must be in place to ensure correct land use decisions are made specifically:

5.4.1 If the ALC is used, the grade 3b should be included as BMV land and protected.

5.4.2 Consideration should be given to combining ALC data with crop yields from June returns.

5.4.3 An alternative land grading system should be developed; this could be based on a simplified Soilscape soils database.

5.4.4 The metric for measuring biodiversity gain (BNG Metric 3) is not appropriate or accurate. A new BNG metric should be commissioned.

Professor Mike Alder
April 2022